

What Is Claimed Is:

1. A steering switch for a vehicle comprising:

a support member which is mounted on a steering wheel,
5 the steering wheel having an annular ring and spokes formed inside
the ring;

a manipulating knob which is rotatably supported on the
support member such that the manipulating knob is rotatable in
front and rear directions of the steering wheel, the manipulating
10 knob projecting inside a space surrounded by the ring and the
spokes;

a rotary support body which is mounted on the support
member and rotatably supports the manipulating knob;

biasing means which bias the manipulating knob such that
15 the manipulating knob returns to a neutral position; and

signal changeover means which are capable of changing
over two kinds of electric signals in response to a rotational
direction of the manipulating knob from the neutral position,
wherein

20 a fulcrum of rotation of the manipulating knob is
provided by supporting both ends of a rod which is inserted into
the manipulating knob using the rotary support body,

wherein the rotary support body is constituted by
joining a first rotary support member which is arranged at one
25 side of the manipulating knob and supports one end of the rod
and a second rotary support member which is arranged at another
side of the manipulating knob and supports another end of the

rod, and

wherein one end of the rod is fixedly mounted on one of the first rotary support member and the second rotary support member while another end of the rod is engaged with another one 5 of the first rotary support member and the second rotary support member.

2. A steering switch for a vehicle according to claim 1, wherein the manipulating knob, the biasing means and the signal changeover means are integrally put together by way of the rotary 10 support body to form an assembled body.

3. A steering switch for a vehicle according to claim 2, wherein the support member is formed by joining a front-side support which is arranged at a front side of the steering wheel and a back-side support which is arranged at a back side of the 15 steering wheel, and

wherein a housing which houses the assembled body therein is provided to one of the front-side support and the back-side support.

4. A steering switch for a vehicle according to claim 20 1, wherein a spacer which holds a distance dimension between the first rotary support member and the second rotary support member to a given dimension is provided between the first rotary support member and the second rotary support member, wherein one end of the spacer is fixedly mounted on one of the first rotary support 25 member and the second rotary support member, and wherein another end of the spacer is engaged with another of the first rotary support member and the second rotary support member using a screw.

5. A steering switch for a vehicle according to claim 1, wherein the signal changeover means include a printed circuit board having a conductive pattern for changing over the two kinds of electric signals and a slide contact which is slidable on the printed circuit board along with rotation of the manipulating knob,

wherein the printed circuit board is arranged parallel to the rotational direction of the manipulating knob and is mounted on one of the first rotary support member and the second rotary support member, and

wherein the slide contact is mounted on the manipulating knob such that the slide contact is slidable on the printed circuit board along with the rotation of the manipulating knob.

6. A steering switch for a vehicle comprising:

15 a support member which is mounted on a steering wheel, the support member having an annular ring and spokes formed inside the ring;

a manipulating knob which is rotatably supported on the support member such that the manipulating knob is rotatable in front and rear directions of the steering wheel, the manipulating knob projecting inside a space surrounded by the ring and the spokes;

a rotary support body which is mounted on the support member and rotatably supports the manipulating knob;

25 biasing means which bias the manipulating knob such that the manipulating knob returns to a neutral position; and

signal changeover means which are capable of changing

over two kinds of electric signals in response to a rotational direction of the manipulating knob from the neutral position, wherein

the manipulating knob, the rotary support body, the
5 biasing means and the signal changeover means are integrally put together to form an assembled body,

wherein the support member is formed by joining a front-side support which is arranged at a front side of the spokes and a back-side support which is arranged at a back side of the
10 spokes, and

wherein a housing which houses the assembled body therein is provided to one of the front-side support and the back-side support.

7. A steering switch for a vehicle according to claim
15 6, wherein, on an inner wall of the housing, a positioning portion which is engaged with a given portion of the assembled body housed in the housing so as to position the assembled body with respect to the housing is mounted.

8. A steering switch for a vehicle according to claim
20 6, wherein the housing is formed on the back-side support.

9. A steering switch for a vehicle according to claim 8, wherein the housing has an insertion opening for inserting the assembled body into the housing at a position which faces the front-side support.

25 10. A steering switch for a vehicle comprising:

a support member which is mounted on a steering wheel, the steering wheel having an annular ring and spokes formed inside

the ring;

a manipulating knob which is rotatably supported on the support member such that the manipulating knob is rotatable in front and rear directions of the steering wheel, the manipulating knob projecting inside a space surrounded by the ring and the spokes;

a rotary support body which is mounted on the support member and rotatably supports the manipulating knob;

biasing means which bias the manipulating knob such that the manipulating knob returns to a neutral position; and

signal changeover means which are capable of changing over two kinds of electric signals in response to a rotational direction of the manipulating knob from the neutral position, wherein

the manipulating knob includes a manipulating knob body which is formed of a member having an L-shaped bend, and wherein a manipulating portion to which a manipulating force is applied by a manipulator is provided at one end side of the manipulating knob body using the bend as reference while the biasing means are provided at another end side of the manipulating knob body,

wherein the rotary support body includes a first side plate which is positioned at one side of the manipulating knob body and a second side plate which is positioned at another side of the manipulating knob body, and wherein the manipulating knob body is rotatably supported between the first side plate and the second side plate, and

wherein the signal changeover means include a printed

circuit board having a conductive pattern corresponding to the two kinds of electric signals and a slide contact which is slidable on the printed circuit board along with rotation of the manipulating knob, wherein the printed circuit board is arranged
5 parallel to the rotational direction of the manipulating knob and is mounted on one of the first side plate and the second side plate, and wherein the slide contact is mounted on the manipulating knob body such that the slide contact is slidable on the printed circuit board along with the rotation of the
10 manipulating knob body.

11. A steering switch for a vehicle according to claim 10, wherein the manipulating knob, the rotary support body, the biasing means and the signal changeover means are integrally put together to form an assembled body,

15 wherein the support member is formed by joining a front-side support which is arranged at a front side of the spokes and a back-side support which is arranged at a back side of the spokes, and

wherein a housing which houses the assembled body
20 therein is provided to one of the front-side support and the back-side support.

12. A steering switch for a vehicle according to claim 10, wherein the biasing means includes a resilient member which is housed in another end side of the manipulating knob body and
25 generates a biasing force for biasing the manipulating knob to the neutral position, a cam member which faces another end of the manipulating knob body in an opposed manner and has a cam

face which guides the manipulating knob to the neutral position,
and a drive member which is slidably inserted into another side
of the manipulating knob body, has one end thereof pushed by the
resilient member and another end thereof brought into contact
5 with the cam face, and

wherein the cam member is detachably mounted on the
rotary support body.

13. A steering switch for a vehicle according to claim
12, wherein a fulcrum of rotation of the manipulating knob is
10 provided by supporting both ends of a rod which is inserted into
the bend of the manipulating knob body using the first side plate
and the second side plate of the rotary support body,

wherein the rotary support body is constituted by
joining a first rotary support member which has the first side
15 plate and supports one end of the rod using the first side plate
and a second rotary support member which has the second side plate
and supports another end of the rod using the second side plate,

wherein the cam member of the biasing means is detachably
mounted on one of the first rotary support member and the second
20 rotary support member,

wherein one end of the rod is engaged with the side plate
of one of the rotary support members to which the cam member is
mounted and another end of the rod is fixedly mounted on the side
plate of the other rotary support member,

25 wherein the printed circuit board of the signal
changeover means is mounted on the side plate of the one rotary
support member, and

wherein a spacer which holds a distance dimension between the first side plate and the second side plate to a given dimension is provided between the first side plate and the second side plate, one end of the spacer is fixedly mounted on the side
5 plate of the one rotary support member and another end of the spacer is engaged with the side plate of the other rotary support member using a screw.

14. A steering switch for a vehicle comprising:

a casing which is mounted on a steering wheel having an
10 annular ring and spokes disposed inside the ring and is formed by joining a front-side casing member which is arranged at front sides of the spokes and a back-side casing member which is arranged at back sides of the spokes;

a first switch which is housed in one of the front-side
15 casing member and the back-side casing member and a second switch which is housed in another casing member;

a first terminal which is mounted on the first switch and transmits an electric signal outputted from the first switch to outside,

20 a second terminal which is mounted on the other casing member and receives the electric signal transmitted from the first terminal;

a first external output terminal which is mounted on another casing member and transmits the electric signal inputted
25 to the second terminal to given equipment; and

a second external output terminal which is mounted on the other casing member and transmits an electric signal

outputted from the second switch to other equipment than the given equipment, wherein

the first terminal and the second terminal are respectively arranged at the one casing member and the other casing member such that the first terminal and the second terminal are brought into contact with each other when the one casing member and the other casing member are joined to each other.

15. A steering switch for a vehicle according to claim 14, wherein a group of external output terminals is formed by collecting the first external output terminal and the second external output terminal at one place.

16. A steering switch for a vehicle according to claim 14, wherein the first switch is formed by integrally putting together a manipulating knob which is rotatably supported on the casing such that the manipulating knob is rotatable in front and rear directions of the steering wheel, the manipulating knob projecting inside a space surrounded by the ring and the spokes, a rotary support body which is mounted on the casing and rotatably supports the manipulating knob, biasing means which biases the manipulating knob such that the manipulating knob returns to a neutral position, and signal changeover means which are capable of changing over two kinds of electric signals in response to a rotational direction of the manipulating knob from the neutral position,

25 wherein the second switch is a push switch which includes a manipulating button exposed to a front side of the front-side casing member, and

wherein the first switch is housed in the back-side casing member while the second switch is housed in the front-side casing member.

17. A steering switch for a vehicle comprising:

5 a casing which is mounted on a steering wheel having an annular ring and spokes disposed inside the ring and is formed by joining a front-side casing member which is arranged at front sides of the spokes and a back-side casing member which is arranged at back sides of the spokes; and

10 a switch which is housed in the casing, wherein the casing includes snap joining portions which are formed on opposing side faces respectively so as to join the front-side casing member and the back-side casing member,

wherein the snap joining portion includes a pair of snap
15 pawls having resiliency and engaging portions which are engaged with the snap pawls, and

wherein a shape of the snap pawls and a shape of the engaging portions are set such that when an external force of not less than a given magnitude in a direction which makes the
20 front-side casing member and the back-side casing member spaced apart from each other is applied to the casing, an outer force which deflects the snap pawls in a direction away from the engaging portions acts on the snap pawls.

18. A steering switch for a vehicle according to claim
25 17, wherein the snap pawl has a projection on which oblique surfaces are formed such that a thickness of the snap pawl is gradually decreased from a distal end to a proximal end of the

snap pawl, and wherein the engaging portion is formed of a hole having an opening and a depth sufficient to allow the whole projection to be fitted therein.

19. A steering switch for a vehicle according to claim 5 17, wherein the casing includes, in addition to the snap joining portion, another snap joining portion for joining the front-side casing member and the back-side casing member, and a joining releasing portion for releasing a joined state of the other snap joining portion by inserting a specific tool.

10 20. A steering switch for a vehicle according to claim 18, wherein, in a vertical direction of the steering wheel, the snap joining portions are arranged at an upper portion of the casing while the other snap joining portion and the engagement releasing portions are arranged at a center of a lower portion 15 of the casing.